

Tuesday January 10, 2006

Study of test dewar vacuum.

Mostly Petros Rapidis (but a bit of C. Kendziora)

09:00 to 10:00 discovered leak in relief valve.

10:18 we stop working on the system

10:50 o-ring vacuum is 1.63 torr, relief vacuum is 1.48 torr

10:51 turn off ion gauge fillament in anticipation of RGA scan
ion gauge at end is 7.74×10^{-7}

11:11 o-ring vacuum is 1.50 torr, relief vacuum is 1.48 torr

11:20 o-ring vacuum at 1.46 torr

each scan takes 5 minutes we are at scan 5 now

11:24 o-ring at 1.43 torr relief valve at 1.47 torr

11:30 o-ring 1.39 torr, relief 1.46 torr

11:33 Scan 7 start o-ring and relief evacuated (Jan9a)

11:42 Relief bled to air, o-ring at 1.39 torr

11:46 Scan 2 start o-ring at vacuum (1.32 torr) relief at air (Jan9b)

12:04 Scan 2 o-ring at air, relief at vacuum (1.64 torr) (Jan9c)

12:29 Scan 4 both evacuated o-ring at 1.45 torr, relief 1.66 torr (not saved)

12:34 repeat scan both evacuated (o-ring 1.38 torr, releif 1.65 torr) (Jan9d)

12:46 repeat scan both evacuated (o-ring 1.29 torr, relief 1.64 torr) (Jan9e)

13:01 both o-ring and relief at air (Jan9f)

13:06 turnon ion gauge again

13:17 ion gauge pressure (with o-ring and relief at air) is now 1.38×10^{-6}

13:28 Pressure stabilizes at 1.30×10^{-6}

14:10 flowing argon in the two areas. Ion gauge turned off.

14:19 first RGA scan - oxygen a bit high - increase flow
of argon in relief to 12 cfh and head to 2 inches water

14:29 scan 3 with argon (Jan9g)

14:40 scan 4 with argon (Jan9h)

14:50 Flowing argon in o-ring, evacuating relief (relief at 2.10 torr)

15:02 scan argon in o-ring, vacuum in relief valve (2.10 torr) (Jan9i)

15:12 turned ion pump on - turning RGA head off

15:33 o-ring vacuum 20.2 torr, relief vacuum 2.12 torr, ion gauge 7.92×10^{-7}

15:35 o-ring and relief up to air

15:38 ion gauge reads 1.13×10^{-6}

15:41 Dewar valved off - turbo turned off

15:58 Ion gauge turned off - have enough data to calculate the leak rate
leak rate .0044 torr/day

peaks	2 hydrogen	18 water	28 nitrogen	32 oxygen	40 argon	RGA derived press	
11:33 a	2.71×10^{-7}	9.56×10^{-7}	1.19×10^{-7}	2.19×10^{-8}	5.58×10^{-9}	1.5×10^{-6}	both vac
11:46 b	2.46×10^{-7}	9.03×10^{-7}	5.50×10^{-7}	1.27×10^{-7}	1.51×10^{-8}	1.5×10^{-6}	relief at air
12:04 c	2.36×10^{-7}	9.36×10^{-7}	1.05×10^{-7}	2.32×10^{-8}	4.49×10^{-9}	1.3×10^{-6}	o-ring at air
12:29	2.34×10^{-7}	9.65×10^{-7}	1.00×10^{-7}	2.04×10^{-8}	4.00×10^{-9}		both vac
12:34 d	2.34×10^{-7}	9.63×10^{-7}	1.01×10^{-7}	2.06×10^{-8}	3.91×10^{-9}		both vac
12:46 e	2.34×10^{-7}	9.75×10^{-7}	9.51×10^{-8}	2.09×10^{-8}	4.11×10^{-9}	1.6×10^{-6}	both evac
13:01 f	2.26×10^{-7}	8.84×10^{-7}	5.51×10^{-7}	1.28×10^{-7}	1.38×10^{-8}	1.7×10^{-6}	both at air
14:29 g	1.97×10^{-7}	7.88×10^{-7}	7.83×10^{-8}	1.87×10^{-8}	8.44×10^{-7}	1.4×10^{-6}	both with argon
14:40 h	2.02×10^{-7}	8.14×10^{-7}	7.81×10^{-8}	1.86×10^{-8}	8.42×10^{-7}	1.6×10^{-6}	both with argon
15:02 i	2.05×10^{-7}	8.17×10^{-7}	8.00×10^{-8}	1.92×10^{-8}	4.34×10^{-9}	1.1×10^{-6}	o-ring argon, relief vacuum

Unit is torr

scan parameter 1-148 amu , 20 pts per amu, speed 1, scale 1

In summary - Relief valve leaks but argon purge is even better than back-pumping.